

### **REMARKS**

In the office action mailed March 27, 2007, Claims 1, 4-13, 27, and 30-48 were pending in the present application. By the present amendment, Claims 1 and 27 have been amended. The Examiner rejected Claims 1, 4-13, 27, 30-33, 37-45, and 48 under 35 U.S.C. § 103(a) as allegedly obvious over Bruxvoort et al. (U.S. Patent 5,219,462) in view of Homola (US 20040096705) and Boyd et al. (U.S. Patent No. 6,495,464). Claims 34-36 as applied to Claim 27 were also rejected as allegedly obvious over Bruxvoort in view of Homola and Boyd and further in view of JP 11-333706. Additionally, Claims 46 and 47 were rejected under 35 U.S.C. § 103(a) as allegedly obvious over Bruxvoort et al. in view of Homola and Boyd and further in view of Bruxvoort et al. (U.S. Patent No. 5,958,794). Each rejection will be addressed in turn below.

#### **Comments and Support for New Claim**

No new matter has been introduced by the present amendment. Claims 1 and 27 have been amended to specify that the substrate and polishing layer are attached at an organic matrix interface. Support for these amendments can be found in FIG. 1; and page 4, lines 1-10; page 9, lines 26-29; page 13, line 22 – page 16, line 17; and page 17, line 14 – page 19, line 7.

#### **Rejections Under 35 U.S.C. § 103(a)**

The standards for establishing a *prima facie* case of obviousness were presented in a previous response. With this in mind, Applicant contends that the cited references fail to make a *prima facie* case of obviousness in that the cited reference combinations fail to teach or suggest all of the claim limitations of Applicant's invention and further, that the references teach away from the proposed combination with Boyd.

*Bruxvoort in view of Homola and Boyd*

Claims 1, 4-13, 27, 30-33, 37-45 and 48 were rejected as allegedly obvious over Bruxvoort in view of Homola and Boyd. Applicant respectfully submits that the amended claims are patentable over the cited references for the reasons set forth previously and those reasons outlined below, and requests that the rejections be withdrawn.

Lack of Each and Every Element

Independent Claims 1 and 27 have been amended to recite that the substrate and polishing layer are attached at an organic matrix interface. In accordance with the present invention, the substrate merely provides a “mechanical support surface” (page 16, lines 27-28) upon which the projections are formed entirely by the slurry. As can be seen in FIG. 1, the substrate is an essentially planar layer that includes the polishing layer on top, the two layers being attached at an organic matrix interface. Furthermore, discussion to methods of manufacturing such article include applying an organic slurry to the substrate, thus forming an organic matrix interface.

In contrast, the cited references fail to teach or otherwise provide individually, and in combination, a fixed abrasive tool including a substrate which is substantially continuously planar with a polishing layer thereon, attached at an organic matrix interface as claimed. Specifically, Bruxvoort requires the use of recesses in an embossed backing sheet that are filled with an abrasive slurry having an expanding agent. During use, the expanding agent is activated and forms the projections while being secured within the recesses and expanding outward above the recesses. Clearly, the embossed backing sheet in Bruxvoort is not a planar substrate, but rather requires recesses in all embodiments.

The Examiner contends that Bruxvoort “discloses a substrate having a planar surface” and further points to figure 4. In the noted embodiment, the embossed backing sheet 51 includes a

backing layer 54 and a surface layer 52. The Examiner compares the surface layer 52 and the abrasive composite members 70 together to the present polishing layer. Even in this embodiment, the comparative polishing layer is not attached to planar substrate at an organic matrix interface. Nor is such attachment taught or suggested in the body of Bruxvoort.

Neither Homola nor Boyd remedy this missing element. Homola is completely silent regarding the topography of any substrate and is focused on the use of loose nanoparticle abrasives in a polishing slurry. Similarly, Boyd teaches substrates which include projections formed integrally therein as shown in FIG. 2 and described throughout. The abrasive portion is then formed as a relatively thin coating over the “patterned substrate.” Thus, Boyd teaches a highly non-planar substrate that is nearly the reverse from Bruxvoort, i.e. projecting features versus recesses. Therefore, none of the cited references teaches a planar substrate attached to a polishing layer at an organic matrix interface as claimed. As such, a *prima facie* case of obviousness cannot be sustained and the rejection should be withdrawn.

#### Teaching Away

As discussed in the previous response, the Boyd reference teaches away from the proposed combination of references. According to MPEP §2145(D)(2), “it is improper to combine references where the references teach away from their combination.” Applicant respectfully submits that Boyd teaches away from combination with Bruxvoort.

Specifically, the Boyd reference actually teaches away from the proposed combination of references, where it teaches a continuous layer of abrasive. Bruxvoort, on the other hand, teaches and relies on discontinuous abrasive. The reference notes that the “abrasive composite member be provided only in and above the recesses.” Col. 7, lines 23-32. This passage also explains that excess

slurry can be removed by scraping the substrate clean between recesses. Further, throughout the specification, the recesses are spaced apart and no mention of continuous layers can be found. In fact, Bruxvoort relies on the discontinuity of the slurry to produce the abrasive regions. Bruxvoort teaches the above-mentioned placement of abrasive composites “only in and above recesses” and other teachings throughout Bruxvoort, a continuous layer would be contrary to the teachings provided therein. For example, Bruxvoort teaches that “areas free of abrasive composite members” is beneficial for many reasons. See col. 5, lines 7-29. Specifically, Bruxvoort asserts that the “presence of the areas free of abrasive composite members...tends to reduce the amount of loading,” provides improved swarf removal, and “tends to make the resulting abrasive article more flexible.” Id. All of these passages specifically reinforce the teaching of Bruxvoort that the abrasive composites are segregated and should not be continuous. Therefore, this passage and the specification of Bruxvoort explicitly, and as a whole, teach away from forming a continuous layer of the abrasive as taught by Boyd. Therefore, the combination of Bruxvoort with Boyd is improper and cannot be sustained.

The combination of Bruxvoort, Homola and Boyd fails to teach or suggest each and every element of the claimed invention and Bruxvoort clearly teaches away from a combination with Boyd. Therefore, Applicant respectfully requests that the rejection based thereon be withdrawn.

*Bruxvoort in view of Homola and Boyd further in view of JP 11-333706*

Claims 34-36 were rejected as allegedly obvious over Bruxvoort in view of Homola and Boyd and further in view of JP 11-333706 (Kazuto). Applicant respectfully submits that the amended claims are patentable over these references. Specifically, the same distinctions apply to this rejection as with the previously discussed rejection. Kazuto simply fails to add anything which

remedies the key deficiencies of the other three references. No additional teaching or suggestion is presented by Kazuto to utilize a polishing layer which is continuous, rather than only using discrete and isolated projections. Additionally, Kazuto fails to teach or suggest a polishing layer attached to a planar substrate at an organic matrix interface. Therefore, Applicant respectfully submits that the cited references fail to render the claimed invention obvious. Accordingly, Applicant requests that the rejections be withdrawn and the claims passed to issue.

*Bruxvoort in view of Homola and Boyd further in view of U.S. Patent 5,958,794*

Claims 46 and 47 were rejected as allegedly obvious over Bruxvoort in view of Homola and Boyd and further in view of U.S. Patent No. 5,958,794 (Bruxvoort '794). Applicant respectfully submits that the amended claims are patentable over this combination of references as well. Specifically, the same distinctions apply to this rejection as with the previously discussed rejection. Further, Bruxvoort '794 provides no additional teaching or suggestion to provide a planar substrate or a polishing layer which is continuous rather than discrete and isolated projections. Therefore, Applicant respectfully submits that the cited references fail to render the claimed invention obvious. Accordingly, Applicant requests that the rejections be withdrawn and the claims passed to issue.

**CONCLUSION**

In view of the foregoing, Applicant believes that presently pending Claims 1, 4-13, 27, and 30-48 present allowable subject matter and allowance is respectfully requested. If any impediment to the entry of this Amendment and allowance of these claims remains after consideration of the above remarks, and such impediment could be removed during a telephone interview, the Examiner is invited to telephone Mr. David Osborne at (801) 566-6633, so that such issues may be resolved as expeditiously as possible.

Please charge any additional fees except for Issue Fee or credit any overpayment to Deposit Account No. 20-0100.

Dated this 26<sup>th</sup> day of June, 2007.

Respectfully submitted,

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